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Application No. 10/698,501
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REMARKS

The amendments to the claims are described below in the **PRESENT AMENDMENT**. The status of the claims is as follows:

- a. Method Claims 1 – 10 and 12-20 are Pending in the present application.
- b. Claims 1-3, 12, 17 and 19 are rejected.
- c. Claims 4-10 and 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
- d. Claim 16 is allowed.
- e. Independent Claims 1, 17 and 19 have been Amended herein.

i. **PRESENT AMENDMENT**

Independent Claims 1, 17(16) and 19(18) were amended to distinctly point out and particularly claim the subject matter the Applicant regards as his invention. Specifically, those claims now recite that each of the plurality of corresponding resistors has a cross-section smaller than that of the MRAM cells. Support for the amendments to Claims 1, 17 and 19 can at least be found in FIGS. 2, 3, 4A, and 4B of the Drawings and on Pages 5-6 and 9 of the Detailed Description. Additionally, Applicant noticed that the claims were missing claim number 11 and has renumbered the claims accordingly.

No new matter was introduced by amending the application.

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ii. **ARGUMENT**

a. **Rejections of Claims 1-3, 12, 17 and 19 under 35 U.S.C. §102(e) (678 Reference)**

For ease of review, Applicant reproduces independent claims 1, 17 and 19 herein below:

1. A magnetic random access memory (MRAM) device, comprising:
 - an array of magnetic memory cells that store data as different values of impedance;
 - a grid of bit and word lines for selectively accessing data in the array of magnetic memory cells; and
 - a plurality of corresponding resistors each placed in series with ones of the magnetic memory cells and the bit and word lines each of the plurality of corresponding resistors having a cross-section smaller than that of the magnetic memory cells;
 - wherein, the corresponding resistors cause localized heating of selected ones of the magnetic memory cells that assists in their switching.
16. A magnetic random access memory (MRAM) device, comprising:
 - an array of magnetic memory cells that store data as different values of impedance;
 - a grid of bit and word lines for selectively accessing data in the array of magnetic memory cell, the grid having a plurality of thermally and electrically resistive portions which provide connections to the magnetic memory cells each of the plurality of thermally and electrically resistive portions having a cross-section smaller than that of the magnetic memory cells; and
 - wherein the resistive portions increase the thermal resistance for heat generated by each memory cell and during operation provide localized heating of active memory cells to ease cell state switching.

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18. A method for operating MRAM devices, comprising:

conducting an electrical current through narrow portions of a spacer that connects memory cells of an MRAM array with bit and word lines so that heat is resistively generated in the narrow portions wherein the spacer has a cross-section smaller than that of the memory cells; and

using the generated heat to ease cell state switching of memory cells.

Applicant asserts that section 102(e) describes a situation in which claims may be rendered unpatentable based upon another's U.S. patent, published U.S. patent application, or PCT patent application published in English. It states that if someone else described the invention in such an application or patent filed before the appellant's invention, then rejection of the appellant's claim to it is proper. Essentially, section 102(e) covers the situation where the application or patent does not specifically claim the invention but does fully disclose the invention. Consequently, Applicant respectfully disagrees with the Examiner's rejection under 102(e).

Varying embodiments of the present invention recite a magnetic random access memory (MRAM) device comprising an array of magnetic memory cells that store data as different values of impedance, a grid of bit and word lines for selectively accessing data in the array of magnetic memory cells and a plurality of corresponding resistors each placed in series with ones of the magnetic memory cells and the bit and word lines each of the plurality of corresponding resistors having a cross-section smaller than that of the magnetic memory cells wherein the corresponding resistors cause localized heating of selected ones of the magnetic memory cells that assists in their switching. (Emphasis added.)

The Applicant respectfully traverses the rejections because all of the elements of independent 1, 17 and 19 as amended herein are not anticipated by U.S. Patent 6,603,678 to Nickel. Specifically, Nickel does not teach or suggest the implementation

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of resistors that have a cross-section smaller than that of the MRAM cell. Nickel discloses a magnetic memory element that is written to by heating the memory element and applying at least one magnetic field to the memory element. The memory element is heated via heating lines which can be formed in a single path or plurality of paths. Each path has one end tied to a reference potential, and the other end coupled to a current source via a transistor.

The Examiner asserts that Nickel discloses a spacer (layer 24, Figure 1 of Nickel) that causes electro-resistive heating (or a thermally insulating material) which would be considered as a resistor. Therefore, layer 24 that is an electrically insulating, thermally conductive material would be considered as a resistor. This may be true, however, as can be seen in Figure 1 of Nickel, Nickel does not teach or suggest the implementation of resistors that have a cross-section smaller than that of the MRAM cell as recited in the independent claims of the present invention. The cross section of layer 24 of the Nickel embodiment is clearly not smaller than the cross section of the MRAM cell.

Furthermore, because the resistors recited in the present invention are comprised of a conductive material that has a relative small cross-sectional area, the cross-sectional area through which heat can be conducted is relatively small. Consequently, more of the heat generated by the memory cell will linger, and the extra heat will ease switching of the magnetic memory cell. The Nickel embodiment does not have these distinct advantages.

Therefore, since Nickel does not teach or suggest the implementation of resistors that have a cross-section smaller than that of the MRAM cell as recited in the independent claims of the present invention, the Nickel reference does not teach or suggest all of the claim limitations as set forth in independent **Claims 1, 17 and 19** as

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amended herein. Consequently, **Claims 1, 17 and 19** are patentably distinct in view of *NickeI* and the rejections of **Claims 1, 17 and 19** under 35 U.S.C. §102(e) ought to now be withdrawn.

Claims 2 – 3 and 12 depend from independent **Claim 1** respectively and inherit all of their limitations. Therefore, **Claims 2 – 3 and 12** are patentably distinct in view of *NickeI* and the rejections of **Claims 2 – 3 and 12** under 35 U.S.C. §102(e) ought to now be withdrawn.

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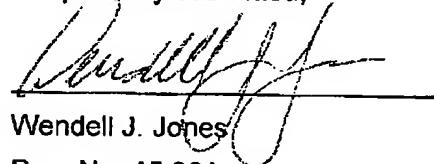
iii. **CONCLUSION**

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Applicant believes that this application is in condition for allowance.

Accordingly, Applicant respectfully requests reconsideration, allowance and passage to issue of the claims as now presented. Should any unresolved issues remain, Examiner is invited to call Applicant's attorney at the telephone number indicated below.

Respectfully submitted,



Wendell J. Jones
Reg. No. 45,961